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Ag Decision Maker
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2016 gross crop margins negative despite lower costs

By Alejandro Plastina, extension economist, 515-294-6160, plastina@iastate.edu

The total costs of corn and soybean production in Iowa are expected to fall, respectively, by 6 percent and 2.5 percent in 2016. The total cost per bushel of corn, is projected at $4.63 for corn following corn (Figure 1, assuming yield of 165 bu./acre); and $3.99 for corn following soybeans (Figure 2, assuming yield of 180 bu./acre). The total cost per bushel of soybeans is projected at $10.67 for the herbicide tolerant variety (figure 3, assuming yield of 50 bu./acre); and $10.66, for the non-herbicide-tolerant variety.

A substantial decline in fertilizer and lime prices, machinery costs, and land rents are expected to more than offset increases in crop protection costs, especially herbicides. Labor costs are projected flat into 2016. Rents for low, medium, and high grade land are projected 1 percent, 2.5 percent, and 5 percent lower, respectively, than the ones used to estimate the 2015 costs of crop production in Iowa.

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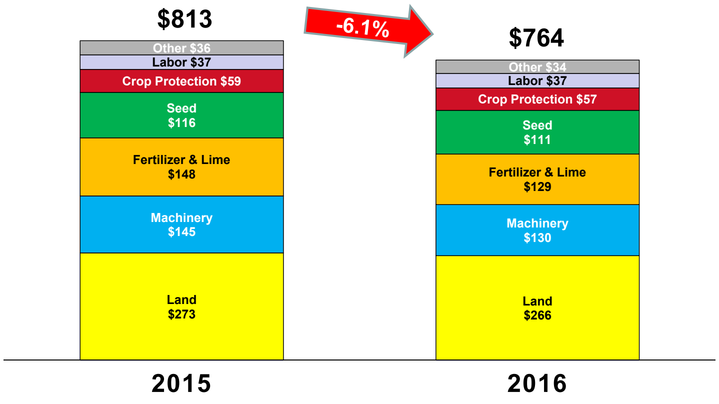
Figure 1. Cost per acre of corn following corn in Iowa



Source: AgDM File A1-20, Estimated Costs of Crop Production - 2016; Yield of 165 bu./acre

Handbook updates

For those of you subscribing to the handbook, the following new updates are included.

Crop Planning Prices – A1-10 (1 page)

Estimated Costs of Crop Production in Iowa - 2016 – A1-20 (13 pages)

Historical Costs of Crop Production – A1-21 (2 pages)

Farm Costs and Returns – C1-10 (10 pages)

Suggested Closing Inventory Prices – C1-40 (2 pages)

Please add these files to your handbook and remove the out-of-date material.

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Inside . . .

IOWA STATE UNIVERSITY
Extension and Outreach

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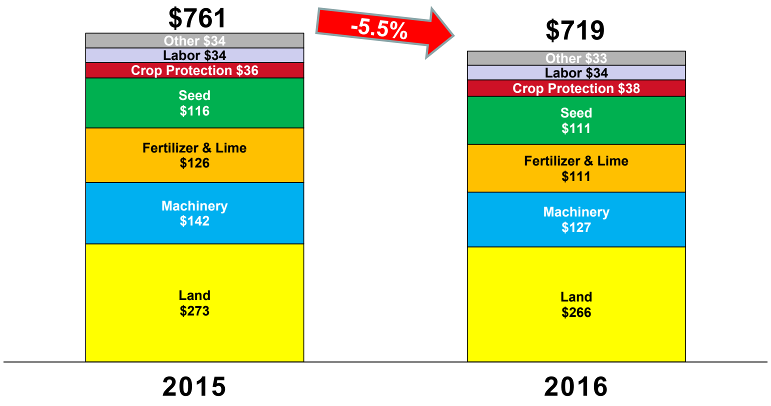
Despite higher fixed costs associated with a slightly higher interest rate, total machinery costs are projected down due to lower diesel and LP gas prices ($2.00 and $1.10 per gallon, respectively). Lower crop prices will result in lower crop insurance liabilities and therefore lower insurance premiums. Average seed prices per bag are projected at $297 for corn, $54 for herbicide-tolerant soybeans and $43 for non-herbicide-tolerant varieties.

The accumulated declines in total costs of corn and soybean production amount, respectively, to 8 percent since 2013 and a 4 percent since 2014. However, these cost reductions are dwarfed by the 47 percent and 37 percent reduction in corn and soybean prices, respectively, between 2012 and 2015. The gross margins per bushel, i.e. the difference between prices and total costs, amounted to -$1.28 for corn following corn, -$0.58 for corn following soybeans, and -$2.06 for herbicide-tolerant soybeans in 2015. The gross margins per acre amount to -$211 for corn following corn, -$104 for corn following soybeans, and -$103 for soybeans.

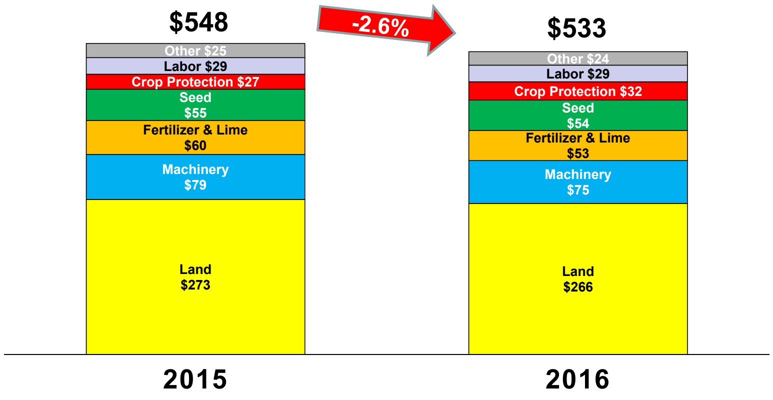
Based on futures prices as of mid-December 2015, the projected 2016 marketing year average prices for corn and soybeans are $3.71 and $8.36 per bushel, respectively. Using those prices, the gross margins are projected to become less negative for corn and more negative for soybeans in 2016: -$0.92 for corn following corn, -$0.28 for corn following soybeans (figure 4), and -$2.31 for herbicide-tolerant soybeans (figure 5). The gross margins per acre would amount to -$152 for corn following corn, -$50 for corn following soybeans, and -$116 for soybeans.

Figure 2. Cost per acre of corn following soybeans in Iowa



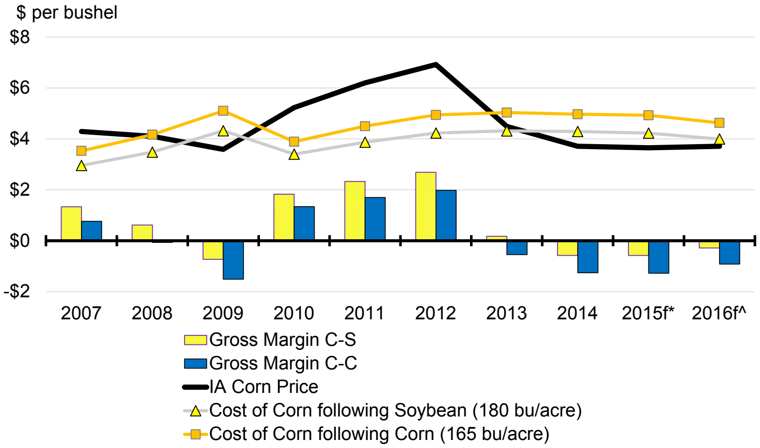
Source: AgDM File A1-20, Estimated Costs of Crop Production - 2016; Yield of 180 bu./acre

Figure 3. Cost per acre of soybeans following corn in Iowa



Source: AgDM File A1-20, Estimated Costs of Crop Production - 2016; Yield of 50 bu./acre

Figure 4. Iowa corn: price, cost and gross margin



**USDA/WASDE Forecast (Mid-point). Dec 9, 2015.*
^Calculation by Dr. Chad Hart based on Corn Futures (CME Group). Dec 16, 2015.

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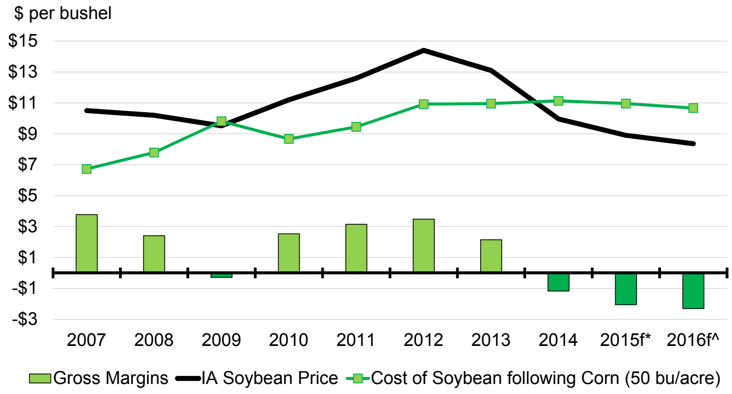
Several caveats apply. First, fertilizer and lime costs include volume and early purchase discounts. Second, producers paying land rents higher than the ones estimated in the report might face higher costs of production. Third, in order to be able to compare budgets through time, calculations are based on a fixed rate of input use. This might be a strong assumption for 2016, when lower crop prices will likely push some producers to look for additional cost savings by changing the mix of inputs used. For example, some producers might opt for seeds with fewer traits than in other years to save on front-loaded input costs.

Finally, crop budgets are calculated assuming average yields remain constant through time. If El Niño characterizes climatological conditions in 2016, then there is a high chance of having higher than average yields. In that case, costs of production per bushel might be lower than reported.

The full report is available online at: http://www.extension.iastate.edu/agdm/crops/pdf/a1-20.pdf.

Figure 5. Iowa soybeans: price, cost and gross margin



**USDA/WASDE Forecast (Mid-point). Dec 9, 2015.*
^Calculation by Dr. Chad Hart based on Corn Futures (CME Group). Dec 16, 2015.

Iowa 2015 land values survey - results and outlook

By Wendong Zhang, extension economist, 515-294-2536, wdzhang@iastate.edu

The Iowa Land Value Survey was initiated in 1941 and is sponsored annually by Iowa State University. Only the state average and the district averages are based directly on the ISU survey data. The county estimates are derived using a procedure that combines the ISU survey results with data from the U.S. Census of Agriculture. Beginning in 2014, the survey has been conducted by the Center for Agriculture and Rural Development in the Economics Department at Iowa State University and Iowa State University Extension and Outreach.

The survey is intended to provide information on general land value trends, geographical land price relationships, and factors influencing the Iowa land market. The survey is not intended to provide an estimate for any particular piece of property.

Interpretation of survey results

The Iowa State University Land Value Survey reported a 3.9 percent decrease to $7,633 in Iowa farmland values from November 2014 to November 2015 (figure 1). This represents a modest decline in Iowa farmland values and the first time that land values have decreased two years in a row since 2000. However, despite continued downward pressures on farm income and farmland prices, current Iowa farmland values are still more than double what they were 10 years ago, 75 percent higher than the 2009 values and 14 percent higher than the 2011 values.

The 2015 survey revealed different conditions within the state. Only one crop reporting district, Northwest, reported a modest increase in land values, (0.7 percent), while North Central showed a 6.7 percent decrease. Additionally, seven counties reported higher

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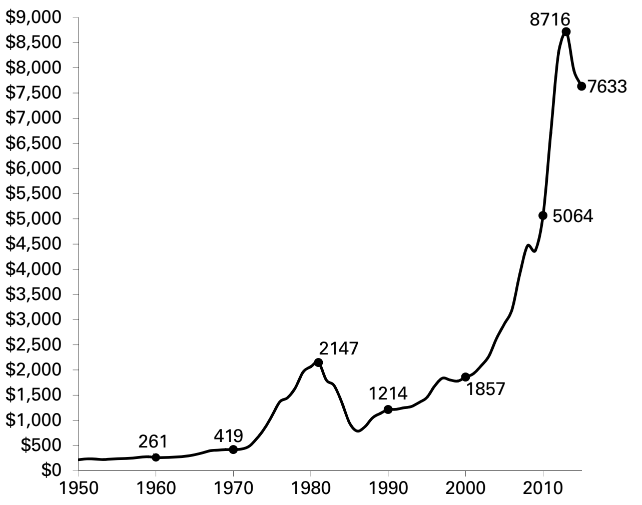
land values in 2015 relative to 2014. This year's survey also revealed different patterns in land values across different land quality classes: while state-average values for high-quality land decreased 5 percent, there was only a mild 0.9 percent decline for low-quality farmland values. In addition, the Southwest (5.4 percent) and Northwest (2.6 percent) districts also reported an increase in low-quality land values. This is likely a combined result of robust livestock returns, strong recreational demand, and higher government payments from conservation programs such as the Conservation Reserve Program (CRP). In general, the results from the 2015 Iowa State University Land Value Survey match results from other surveys. The Federal Reserve Bank of Chicago reported Iowa land values down 1 percent from October 2014 to October 2015. The same survey reported Iowa land values decreased by 1 percent from July to October, 2015. The USDA reported Iowa farmland values down by 5.9 percent from June 2014 to June 2015. The Realtors Land Institute reported land values down 7.6 percent from September 2014 to March 2015 but only down 3.7 percent from March 2015 to September 2015.

It is important to remember that the Iowa State University survey is an opinion survey covering the period from November 2014 to November 2015. When comparing surveys be sure to consider the period covered. This can be especially relevant in times when the land values are not exhibiting a uniform change.

There were several new features added to this year's survey. A few of the highlights are: an online version, in addition to the traditional mail copy, was made available. Of the 514 respondents, 287 (55 percent) completed the survey online. Second, respondents were asked to predict how the land values in their territory would change next year and five years from now. Seventy-seven percent of the participants predicted the land values in their territory would continue to fall over the next year, while the remaining 23 percent thought land values would increase or stay the same in their territory over the next year. When asked to predict land values five years from now, 48 percent predicted land values would increase or remain the same. Third, this year's survey asked about the main occupation of respondents, with agricultural lenders, appraisers, farm managers, and those in ag sales making up the bulk of the respondents. Finally, to gauge how each respondent defined high-, medium-, and low-quality land for their county, we asked for estimated average CSR (Corn Suitability Rating) and CSR2 points for all land quality classes. Results show that agricultural professionals have adapted to CSR2. About 60 percent of participants provided at least one CSR2 estimate for the corresponding land quality class.

Figure 1. Average value per acre of Iowa farmland.



Source: Iowa State University Land Value Survey

Outlook for land values

The results of the 2015 Iowa State University Farmland Value Survey are not surprising. With the decline in corn and soybean prices, in addition to the 8.9 percent decline in farmland values in 2014, landowners and agricultural professionals familiar with farmland markets have already expected farmland values to decline this year. The 3.9 percent decline may seem less than what many people speculated, especially given the most recent prediction from the USDA that U.S. net farm income would be down 38 percent from last year. However, I would argue that the 3.9 percent decline is not out of line due to a mix of factors. First, despite the sharp decline in corn and soybean prices, many farmers still have a lot of cash in hand accumulated from the golden 2000s. Second, it was widely accepted among farmers and landowners at the start of 2015 that commodity prices, farm income, and profit margins probably wouldn't improve much over the year, and arguably the farmland market has already capitalized these expectations. Therefore, the downward pressures did not cause a panic market reaction. Finally, despite the weakening agricultural

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exports, especially from China, the U.S. economy is still more robust than many other countries across the globe. Of particular interest to farmland markets, the livestock sector still saw strong growth, recreational demand is on the rise, and high CRP payments are boosting the values of pastureland, timberland, and low-quality cropland.

The primary reason for the drop or slowdown in land values is the drop in net farm income. Land values are determined by the income and the interest (discount) rate used. Net farm income has been at record high levels the past few years and interest rates have been at record low levels. This combination produced record high farmland values over the past decade. In August, the USDA forecast net farm income to be down 26 percent for 2013-2014 and down another 38 percent for 2014-2015, which is a direct result of the sharp decline in corn and soybean prices. The forecast net farm income for 2015 would be the lowest since 2006.

A simple regression analysis with farmland values as a function of net farm income shows a one percent decrease in income will produce approximately a one-half percent decrease in farmland values. This relationship is not exact or immediate but there is an extremely strong relationship, which indicates what will happen to land values with a change in income.

Interest rates are also an important determinant of farmland values. The Federal Reserve Board had long discussed the end of the low-interest era, but the global economic slowdown has postponed these efforts for now, and perhaps into the foreseeable future. The current 10-year Treasury bond rates averaged 2.12 percent during the first three quarters of 2015 - lower than the 2.54 percent average rate during 2014. Some people feel that interest rates are more important than net income in determining farmland values; putting these arguments aside, the Federal Reserve Board will likely raise interest at a slow rate as opposed to an immediate increase.

With the decline in farm income and a possible increase in interest rates, we might see farmland values continue to recede if the forecasts for low commodity prices and the global stock recovery for grains and oilseeds are realized next year and beyond. The Iowa farmland market appears to have peaked for the foreseeable future, and we may expect to see the Iowa farmland market drifting sideways.

In the 2015 Iowa Land Value Survey, over 75 percent of all respondents said farmland values in their territory would continue to decline next year, but only six percent of all respondents said values would decrease 10 percent or more. The majority of agricultural professionals tend to think land values in their territory will either experience a modest decline of less than 5 percent or decline 5 to 10 percent next year. The predictions of land values five years from now yield a more mixed picture: 32 percent and 17 percent of respondents predicted land values would go up or stay the same, respectively, while 19 and 18 percent of respondents projected land values would decrease 5 to 10 percent or decrease more than 10 percent five years from now, respectively. Based on estimates from Iowa State University Soil Management and Land Valuation conferences, the margin of error in the forecasts of agricultural professionals is larger when projecting values for a distant future as opposed to the months ahead.

Iowa farmers made record income over the past several years, and a major question is what they did with that income. Some farmers appear to have saved it or paid down existing debt, but other farmers appear to have parlayed the income into more debt with additional land and new machinery and buildings, etc. There is a concern for some producers over possible financial difficulties due continually declining income and accumulation of debt from banks and other sources. It appears most farmers will be able to weather the storm as the market prices find a new equilibrium, but farmers and land owners who bet on the high commodity prices lasting and aggressively expanded or borrowed heavily will face significant problems in the months ahead.

Some of the survey respondents reported strong auction sales where existing farmers were aggressively bidding for neighboring properties or some other particularly desirable parcel. These buyers appeared to have the money and to that extent they will provide support for the land market. As the survey indicated, existing farmers still account for the majority of the land purchased in Iowa, and robust livestock returns, strong recreational demand, and high CRP payments drove the increases in land values in the Northwest and South Central districts.

Many people are concerned about a potential farmland bubble burst, or a replay of the 1920s economic

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depression or 1980s farm crisis. There are legitimate reasons to be cautious, especially with the slowing Chinese economy and potential rise in interest rates. However, Iowa farmland values do not appear to be in a speculative bubble that caused dramatic declines in the 1980s farmland values or the urban real estate market in the mid-2000s. In the 1970s, there wasn't steady growth in farm income before the sudden collapse of farmland values. Farmers now have accumulated substantial income during the last decade thanks to high commodity prices, and the current farmland values don't seem to diverge too much from the economic fundamentals. There wasn't irrational buying and selling in a panic and the demand for U.S. crop and livestock products is still very strong. The downward pressures on farmland values likely will continue to play out next year and beyond, but it will more likely be a rational and modest correction as opposed to a sudden change.

It is not possible to say where the farmland values will stabilize, however, the odds of commodity prices collapsing, a sudden stoppage of the Chinese economy, interest rates rapidly increasing, and/or land values collapsing are not high. The odds are not zero, but it doesn't appear these events will occur in the foreseeable future.

A more likely scenario is that farmland values will return to more normal changes experienced over the past century. Since 1910 Iowa farmland values have averaged a 4.9 percent increase per year. Farmland values have increased 73 percent of the years, decreased 25 percent of the years and remained unchanged for 3 years between 1910 and 2015. Farmland has historically been a fairly robust investment that generates relatively stable returns, and the Iowa farmland market seems to continue drifting sideways to slightly lower.

There have been three 'golden' eras for Iowa land values over the past 100 years. The first one ended in a long, drawn-out decline in land values from 1921 to 1933, the second golden era ended with a sudden collapse from 1981 to 1986. The third golden era appears to have ended with an orderly adjustment as opposed to a sudden collapse.

More details of the survey can be accessed at www.card.iastate.edu/farmland/.

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Internet Updates

The following Information Files and Decision Tools have been updated on www.extension.iastate.edu/agdm.

Estimated Costs of Crop Production in Iowa - 2016 - A1-20 (Decision Tools)

To Grow or not to Grow: A Tool for Comparing Returns to Switchgrass for Bioenergy with Annual Crops and CRP – A1-27 (2 pages)

To Grow or not to Grow: A Tool for Comparing Returns to Switchgrass for Bioenergy with Annual Crops and CRP – A1-27 (Decision Tool)

Financial Performance Measures for Iowa Farms – C3-55 (8 pages)

Current Profitability

The following tools have been updated on www.extension.iastate.edu/agdm/info/outlook.html.

Corn Profitability – A1-85
Soybean Profitability – A1-86
Iowa Cash Corn and Soybean Prices – A2-11
Season Average Price Calculator – A2-15
Ethanol Profitability – D1-10
Biodiesel Profitability – D1-15

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